

**REMARKS/ARGUMENTS**

Claims 1-22 are pending. Claims 1-2, 4-6, 8, and 13 were rejected under 35 U.S.C. 103(a) as obvious over U.S. Patent No. 1,765,560 to Clapp (“Clapp”). Claims 1-4 were rejected under 35 U.S.C. 103(a) as obvious over U.S. Patent No. 5,770,013 to Chance et al. (“Chance”) in view of Clapp or U.S. Patent No. 5,203,965 to McCowan. Claims 5-18 were rejected under 35 U.S.C. 103(a) as obvious over Chance in view of the combination of Clapp or McCowan, and further in view of U.S. Patent No. 5,227,024 to Gomez (“Gomez”) and U.S. Patent No. 5,505,395 to Qiu et al. (“Qiu”). Finally, Claims 19-22 were rejected under 35 U.S.C. 103(a) as obvious over Chance in view of the combination of Clapp or McCowan, Gomez, Qiu, and U.S. Patent No. 6,033,352 to Howard et al. (“Howard”).

While it is generally true that a claimed range does not distinguish over an overlapping range found in the prior art, Applicant respectfully submits that independent Claims 1, 5, 15, and 19 are not simply directed to a claimed range. Instead, Claims 1, 5, 15, and 19 each recite: 1) a claimed range of wood sawdust content; and 2) that a substantial portion of the claimed sawdust falls within specific particle size limitations. More specifically, independent Claims 1, 5, 15, and 19 are directed to paperboard sheets and tubes comprising a “layer containing cellulose fibers and a sufficient quantity of wood sawdust such that the resulting paperboard sheet contains **between 1 and 40 percent wood sawdust by weight, wherein at least 95 percent of the sawdust by weight has a particle size greater than 350 micrometers and less than 3175 micrometers[.]**” As described in detail below, none of the cited references taken alone or combination teach or suggest paperboard tubes or sheets having the recited sawdust concentration and the recited proportion of the sawdust concentration within the claimed particle size limits.

The Chance Patent

Chance is directed to a method for manufacturing high-quality paper without requiring the use of a size press. Chance discloses a method of manufacturing a multi-ply paper comprising short wood fibers in an amount of about 20% to about 25 %, by weight, wherein the

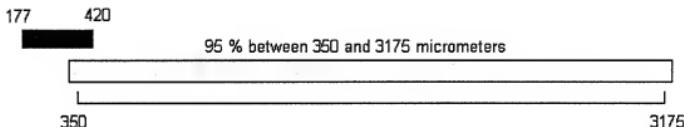
short wood fibers comprise about 5-70 % sawdust. Chance additionally discloses that an inner ply of the multi-ply sheet comprises at least 1 % sawdust. Column 8, lines 33-38; *see also* Figure 4. Based upon these disclosures, the Office Action suggests that Chance teaches a sawdust concentration for the multi-ply sheet of between 1-17.5 %. Assuming for the sake of argument that Chance actually discloses a sawdust concentration for the multi-ply sheet of between 1-17.5%, Chance does not teach or suggest that any portion of its sawdust lies within the claimed particle size limits. As noted in the Office Action, Chance does not disclose the use of sawdust wherein “at least 95 percent of the sawdust by weight has a particle size greater than 350 micrometers and less than 3175 micrometers” as expressly required by independent Claims 1, 5, 15, and 19.

The Clapp Patent

Clapp is directed to a method for manufacturing paperboard that is coated on one surface by china clay, blanc fixe, or other similar materials for imparting a smooth satiny finish to the paperboard. Clapp discloses that its paperboard includes a bottom layer of a suitable paper stock and a top layer of 5 to 20 parts bleached sulphite pulp, 10 to 20 parts wood flour, 10 to 20 parts cellite, 50 to 70 parts china clay, 10 parts silicate of soda, and 5 parts alum. Page 1, line 88 to Page 2, line 13. Clapp discloses that its wood flour may be substituted for “finely divided sawdust capable of passing through a 40 to 80 mesh sieve”, however, Clapp goes on to state that resulting paperboard is “not quite as satisfactory when the finely-divided sawdust is used as when the wood flour is used.” Page 2, lines 71-79. The Office Action asserts that use of a 40 to 80 mesh sieve would produce sawdust particles of up to 420  $\mu\text{m}$ .

It is common practice in the chemical arts to use a two number mesh size convention when describing a particular sieve. The first number is typically set off by a negative sign (-) and indicates the size of particles that will pass through the sieve. The second number is typically set off by a positive sign (+) and indicates the size of particles that are retained by the sieve. *See* Aldrich, Catalog/Handbook of Fine Chemicals, T848 (2003-2004) attached as Appendix A. Approximately 90 % of the particles sifted through such conventional sieves lie within the stated range. For example, a -4 to +40 sieve suggests that 90% or more of the sifted

material would pass through a 4 mesh sieve (particles smaller than 4.76 mm) and be retained by a 40 mesh sieve (particles larger than 420  $\mu\text{m}$ ). *Id.* Clapp discloses a “40 to 80 mesh sieve” and, despite omitting the customary positive (+) and negative (-) signs, appears to suggest that 90 percent of the “finely divided sawdust” would pass through a 40 mesh sieve (420  $\mu\text{m}$ ) and be retained by an 80 mesh sieve (177  $\mu\text{m}$ ). This range is illustrated relative to the claimed sawdust particle size range in Figure A below.

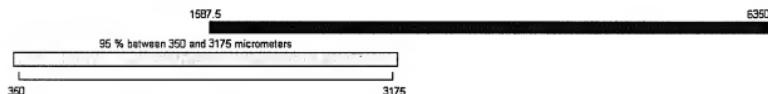


**Figure A**

The Office Action suggests that “it would have been obvious to a person skilled in the art at the time of the invention to use sawdust with at least 95 % of the particles having a size between 350 to 420  $\mu\text{m}$  with a reasonable expectation of success in producing an acceptable paperboard.” Office Action, p. 2. Emphasis added. Applicant respectfully disagrees. Assuming a linear sawdust particle size distribution, Clapp teaches that only 29 % ( $(420-350)/(420-177)$ ) of its sawdust would fall within the recited particle size limits. Clapp notes, however, that paper produced from finely divided sawdust is “not quite satisfactory” when compared to paper produced from smaller wood flour particles. Page 2, lines 76-78. Accordingly, were one of ordinary skill in the art to produce a paper carrier web from Clapp’s less desired material, i.e., sawdust, such an artisan would be taught by Clapp to adopt a sawdust particle size distribution that is not linear as assumed above but rather one that is focused predominantly toward the disclosed lower limit of 177  $\mu\text{m}$  to more closely approximate Clapp’s more desired material, i.e., wood flour. Thus, it is reasonable to expect that far less than 29 % of the sawdust used would lie within the recited sawdust particle size limits. In any event, Clapp certainly does not teach or suggest a paperboard product having a quantity of sawdust wherein “at least 95 percent of the sawdust by weight has a particle size greater than 350 micrometers and less than 3175 micrometers” as expressly required by independent Claims 1, 5, 15, and 19.

The McCowan Patent

McCowan is directed to a method for manufacturing tissue and writing paper from a pulp containing a proportion of sawdust. McCowan discloses that its sawdust is sifted through No. 12 to No. 3 sized screens. This sifting is said to remove sawdust "fines" and "flour" and to isolate sawdust particles sized between  $\frac{1}{16}$  inch and  $\frac{1}{4}$  inch, respectively (i.e., between 1587.5 and 6350  $\mu\text{m}$ ). This range is illustrated relative to the claimed sawdust particle size range in Figure B below.



**Figure B**

McCowan discloses that sawdust particles of this size may donate fibers acceptable for papermaking and that "expectations now are that some tissue paper can be made with screened sawdust exclusively (i.e., no chip pulp)." Column 5, lines 9-11. Echoing the conclusion expressed with regard to Clapp above, albeit over an inexplicably divergent particle size range, the Office Action suggests that "it would have been obvious to a person skilled in the art at the time of the invention to use sawdust with at least 95 % of the particles having a size between 1590 and 3175  $\mu\text{m}$ " in the paperboard of Chance in view of McCowan to obtain good strength and formation properties. Office Action, pgs. 2-3. Applicant respectfully disagrees. Assuming a linear sawdust particle size distribution, McCowan teaches that only 33 % ((3175-1587.5)÷(6350-1587.5)) of its sawdust would fall within the recited particle size limits.

McCowan is concerned with the problem of digesting sawdust to extract cellulose fibers of a sufficiently long length to produce tissue paper having an acceptable total strength factor (TSF). As noted in the McCowan specification, it is "the length of the wood fibers of the pulp that largely determines the strength of the paper." Column 1, lines 34-36. Thus, one of ordinary skill in the art who chose to follow McCowan and was interested in producing paper having "good strength and formation properties" would likely not adopt the linear particle size

distribution assumed above but would instead be taught to adopt a sawdust particle size distribution focused generally toward McCowan's upper particle size limit of 6350  $\mu\text{m}$ . Thus, it is reasonable to expect that far less than 33 % of the sawdust used would lie within the recited sawdust particle size limits. In any event, McCowan, taken alone or in combination with Chance, certainly does not teach or suggest a paperboard product having a quantity of sawdust wherein "at least 95 percent of the sawdust by weight has a particle size greater than 350 micrometers and less than 3175 micrometers" as expressly required by independent Claims 1, 5, 15, and 19.

To reject additional claims, the Office Action relies on disclosure provided within the Gomez and Qiu patents that multi-ply paperboard sheets may comprise layers having differing densities. However, the Office Action neglects to note that Gomez expressly teaches away from the claimed paperboard by disclosing that its low density filler is comprised of a pulverized vegetable filler or wood waste material wherein "at least 95% by weight of the particles...are less than 150 micrometers in size and at least 80 % by weight of the particles are greater than 10 micrometers in size." Abstract, column 4, lines 9-15, and lines 58-66. As such, Applicants respectfully submit that Gomez is not combinable with any reference for purposes of rendering obvious Claims 1, 5, 15, and 19, which require "at least 95 percent of the sawdust by weight has a particle size greater than 350 micrometers and less than 3175 micrometers." While disclosing that paper tubes may include layers of differing densities, the Qiu reference does not teach or suggest that such differing densities are attributable to the use of sawdust within a low-density paperboard layer. Thus, Qiu cannot teach or suggest that "at least 95 percent of the sawdust by weight has a particle size greater than 350 micrometers and less then 3175 micrometers."

Finally, the Office Action relies on Chance, Clapp or McCowan, Gomez, Qiu, and Howard's disclosure of spiral winding in order to reject Claims 19-22. Applicants respectfully submit that the Office Action's conclusion that Claims 19-22 are obvious in view of the combination of the above six references is impermissibly based on hindsight. There is no implicit or explicit motivation, outside of Applicants' present disclosure, to combine this vast array of references. However, as discussed in detail above, even if all six of the above references

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were improperly combined they still would not teach or suggest every element of independent Claims 1, 5, 15, and 19. None of the cited references, taken alone or in combination, teach or suggest a paperboard sheet comprising "at least one layer containing cellulose fibers and a sufficient quantity of wood sawdust such that the resulting paperboard sheet contains between 1 and 40 percent wood sawdust by weight, wherein at least 95 percent of the sawdust by weight has a particle size greater than 350 micrometers and less than 3175 micrometers" as expressly required by independent Claims 1, 5, 15, and 19.

For at least the reasons set forth above, it is respectfully submitted that independent Claims 1, 5, 15, and 19 are patentable over the cited references. Thus, dependent Claims 2-4, 6-14, 16-18, and 20-22 are patentable over these references as well.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefor (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,



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